

Purdue Weed Science

Belchim - Evaluation of Soybean Crop Tolerance to Tough 5 EC

Trial ID: 21S-TPAC-SOY-18 Location: TPAC Trial Year: 2021
 Protocol ID: 21S-TPAC-SOY-18 Investigator (Creator): Dr. Bill Johnson
 Project ID: Study Director: Brent Mansfield
 Sponsor Contact: Dennis Long - Belchim

General Trial Information
Study Director: Brent Mansfield **Title:** Research Associate
Investigator: Dr. Bill Johnson **Title:** Professor

Discipline: H herbicide
Trial Status: E established **Trial Reliability:** 1 usable data
ARM Trial Created On: 7/10/2021
Initiation Date: 5/23/2021

Trial Location
City: Lafayette **Country:** USA United States
State/Prov.: Indiana
Postal Code: 47907

Conducted Under GLP: No
Conducted Under GEP: No

Contacts

Role: STYDIR study director
Study Director: Brent Mansfield **Title:** Research Associate
Organization: Purdue University
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City: West Lafayette **State/Prov:** IN **Postal Code:** 47907

Role: INVEST investigator
Investigator: Dr. Bill Johnson **Title:** Professor
Organization: Purdue University
Address 1: 915 W. State Street
Country: USA United States **E-mail:** wgj@purdue.edu
City: West Lafayette **State/Prov:** IN **Postal Code:** 47907

Role: SPONSR sponsor
Sponsor: Dennis Long - Belchim

Crop Description
Crop 1: C GLXMA Glycine max Soybean **Stage Scale:** BBCH

Variety: AG29XF1
Attributes: XtendFlex
Planting Date: 5/23/2021 **Planting Rate:** 140000 S/A
Depth: 1.5 IN
Rows per Plot: 7 **Planting Method:** PLANTD planted
Row Spacing: 15 IN **Planting Equipment:** PP plot planter
Soil Temperature: 60 f **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/2/2021
Harvest Date: 10/20/2021

Harvested Width: 8.75 FT
Harvested Length: 27 FT

% Standard Moisture: 13

Site and Design
Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 30 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 300.0 FT2 **Treatments:** 6 **Tillage Type:** CONTIL conventional-till
Replications: 4 **Study Design:** RACOB� Randomized Complete Block (RCB)

Soil Description
Description Name: TPAC- Field 2H
% Sand: 19 **% OM:** 3.1 **Texture:** SIL silt loam
% Silt: 56 **pH:** 5.4 **Soil Name:** Toronto-Millbrook Complex
% Clay: 25 **CEC:** 13.9 **Fert. Level:** G good

Weather Conditions
Closest Weather Station: TPAC **Distance:** 0.1 MI

No.	Date	Moisture Total	Unit	Min Temp	Max Temp	Temp Unit
1.	5/1/2021	0	IN	40	63	F
2.	5/2/2021	0	IN	49	74	F
3.	5/3/2021	0.26	IN	56	78	F
4.	5/4/2021	0.01	IN	55	66	F

5.	5/5/2021	0.04	IN	43	59	F
6.	5/6/2021	0	IN	42	61	F
7.	5/7/2021	0.25	IN	38	58	F
8.	5/8/2021	0	IN	32	63	F
9.	5/9/2021	1.43	IN	40	57	F
10.	5/10/2021	0.37	IN	37	47	F
11.	5/11/2021	0.09	IN	39	59	F
12.	5/12/2021	0	IN	36	61	F
13.	5/13/2021	0	IN	38	60	F
14.	5/14/2021	0	IN	41	66	F
15.	5/15/2021	0	IN	46	70	F
16.	5/16/2021	0	IN	53	71	F
17.	5/17/2021	0.35	IN	55	71	F
18.	5/18/2021	0.12	IN	58	63	F
19.	5/19/2021	0	IN	59	72	F
20.	5/20/2021	0	IN	64	75	F
21.	5/21/2021	0	IN	64	84	F
22.	5/22/2021	0	IN	63	83	F
23.	5/23/2021	0	IN	63	85	F
24.	5/24/2021	0	IN	68	85	F
25.	5/25/2021	0	IN	67	88	F
26.	5/26/2021	0.32	IN	66	87	F
27.	5/27/2021	0.19	IN	58	81	F
28.	5/28/2021	0.08	IN	60	80	F
29.	5/29/2021	0.47	IN	43	61	F
30.	5/30/2021	0	IN	41	63	F
31.	5/31/2021	0	IN	43	71	F
32.	6/1/2021	0	IN	57	71	F
33.	6/2/2021	0.04	IN	58	74	F
34.	6/3/2021	0.03	IN	59	87	F
35.	6/4/2021	0	IN	61	82	F
36.	6/5/2021	0	IN	63	88	F
37.	6/6/2021	0	IN	66	86	F
38.	6/7/2021	0.01	IN	69	83	F
39.	6/8/2021	0.1	IN	69	83	F
40.	6/9/2021	0	IN	70	85	F
41.	6/10/2021	0	IN	67	85	F
42.	6/11/2021	0	IN	69	85	F
43.	6/12/2021	0	IN	67	90	F
44.	6/13/2021	0	IN	69	93	F
45.	6/14/2021	0	IN	63	86	F
46.	6/15/2021	0	IN	57	83	F
47.	6/16/2021	0	IN	53	81	F
48.	6/17/2021	0	IN	53	82	F
49.	6/18/2021	0.01	IN	61	86	F
50.	6/19/2021	0.47	IN	67	93	F
51.	6/20/2021	0	IN	67	81	F
52.	6/21/2021	0.1	IN	70	86	F
53.	6/22/2021	0	IN	49	72	F
54.	6/23/2021	0	IN	54	74	F
55.	6/24/2021	0	IN	60	77	F
56.	6/25/2021	1.19	IN	63	79	F
57.	6/26/2021	0.83	IN	70	81	F
58.	6/27/2021	1.05	IN	69	85	F
59.	6/28/2021	0.11	IN	69	86	F
60.	6/29/2021	0	IN	72	88	F
61.	6/30/2021	0	IN	72	89	F
62.	7/1/2021	0.35	IN	70	78	F
63.	7/2/2021	0	IN	55	82	F

64.	7/3/2021	0	IN	53	75	F
65.	7/4/2021	0	IN	57	78	F
66.	7/5/2021	0	IN	67	85	F
67.	7/6/2021	0	IN	68	86	F
68.	7/7/2021	0	IN	71	86	F
69.	7/8/2021	1.29	IN	67	86	F
70.	7/9/2021	0.05	IN	59	80	F
71.	7/10/2021	0.03	IN	61	73	F
72.	7/11/2021	0.1	IN	65	76	F
73.	7/12/2021	1.3	IN	66	76	F
74.	7/13/2021	0.4	IN	67	82	F
75.	7/14/2021	0.08	IN	65	79	F
76.	7/15/2021	0	IN	66	82	F
77.	7/16/2021	0.16	IN	69	86	F
78.	7/17/2021	0.1	IN	66	78	F
79.	7/18/2021	0.01	IN	66	80	F
80.	7/19/2021	0	IN	61	83	F
81.	7/20/2021	0	IN	61	82	F
82.	7/21/2021	0	IN	64	83	F
83.	7/22/2021	0	IN	64	79	F
84.	7/23/2021	0	IN	67	83	F
85.	7/24/2021	0	IN	71	86	F
86.	7/25/2021	0	IN	69	87	F
87.	7/26/2021	0	IN	65	88	F
88.	7/27/2021	0	IN	62	87	F
89.	7/28/2021	0	IN	66	86	F
90.	7/29/2021	0	IN	70	87	F
91.	7/30/2021	0	IN	65	88	F
92.	7/31/2021	0	IN	62	78	F

Application Description

	A
Application Date	7/10/2021
Appl. Start Time	10:00 AM
Appl. Stop Time	10:15 AM
Application Method	SPRAY
Application Timing	V4-V6
Application Placement	BROFOL
Air Temperature Start, Stop	70, 70 F
% Relative Humidity Start, Stop	77, 77
Wind Velocity+Dir. Start	3 MPH, ESE
Wind Velocity+Dir. Stop	5 MPH, ESE
Wind Velocity+Dir. Max	5 MPH, ESE
Wet Leaves (Y/N)	N, no
Soil Temperature	70 F
Soil Moisture	WET
% Cloud Cover	95

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	GLXMA, BSOY
Days after Emergence	38
Stage Majority, Percent	16, -
Stage Minimum, Percent	16, -
Stage Maximum, Percent	59, -
Height Average	12 IN
Height Minimum, Maximum	10, 14

Application Equipment

	A
Appl. Equipment	CO2 BACKPACK
Equipment Type	BACSPR
Operation Pressure	32 PSI
Nozzle Model	AIXR
Nozzle Type	FLAFAI
Nozzle TradeName	TEEJET
Nozzle Tip Size, Color	110015, GREEN
Nozzle Spacing	15 IN
Nozzles/Row	8
Boom Length	10 FT
Boom Height	29.0 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Mix Size	1.8 L
Propellant	COMCO2

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Project ID:	Study Director: Brent Mansfield	
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Crop Type, Code	C, GLXMA	C, GLXMA	C, GLXMA	C, GLXMA	C, GLXMA	C, GLXMA		
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean		
Rating Date	7/17/2021	7/24/2021	7/31/2021	10/20/2021	10/20/2021	10/20/2021		
Part Rated	PLANT, C	PLANT, C	PLANT, C					
Rating Type	PHYGEN	PHYGEN	PHYGEN	WEIGHT	MOICON	YIELD		
Rating Unit/Min/Max	% , 0, 100	% , 0, 100	% , 0, 100	LB, -, -	% , 0, 100	BU, -, -		
Number of Subsamples	1	1	1	1	1	1		
Data Entry Date	11/29/2021	11/29/2021	11/29/2021	11/29/2021	11/29/2021			
Rating Timing	7 DAA	14 DAA	21 DAA					
Days After First/Last Applic.	7, 7	14, 14	21, 21	102, 102	102, 102	102, 102		
Trt-Eval Interval	7 DA-A	14 DA-A	21 DA-A	102 DA-A	102 DA-A	102 DA-A		
Days After Emergence	45 DE-1	52 DE-1	59 DE-1	140 DE-1	140 DE-1	140 DE-1		
ARM Action Codes						TY1		
Number of Decimals						1		
Trt Treatment No. Name	Rate	Appl Code	1	2	3	4	5	6
1 CONTROL			0.0	0.0	0.0	27.693	13.45	84.7
ROUNDUP POWERMAX	32 FL OZ/A	A						
AMSOL	2.5 % V/V	A						
2 ROUNDUP POWERMAX	32 FL OZ/A	A	1.5 c	1.0 c	0.0 b	25.735 -	13.35 -	78.8 -
TOUGH	8 FL OZ/A	A						
AMSOL	2.5 % V/V	A						
3 ROUNDUP POWERMAX	32 FL OZ/A	A	2.0 bc	1.0 c	0.0 b	26.498 -	13.45 -	81.0 -
TOUGH	12 FL OZ/A	A						
AMSOL	2.5 % V/V	A						
4 ROUNDUP POWERMAX	32 FL OZ/A	A	2.5 bc	1.0 c	0.3 b	27.793 -	13.53 -	84.9 -
TOUGH	16 FL OZ/A	A						
AMSOL	2.5 % V/V	A						
5 ROUNDUP POWERMAX	32 FL OZ/A	A	11.3 a	5.5 a	1.5 a	26.323 -	13.45 -	80.5 -
COBRA	12.5 FL OZ/A	A						
AMSOL	2.5 % V/V	A						
6 ROUNDUP POWERMAX	32 FL OZ/A	A	4.0 b	3.0 b	0.5 b	28.020 -	13.50 -	85.6 -
FLEXSTAR	1.3 PT/A	A						
AMSOL	2.5 % V/V	A						
LSD P=.05			2.22	1.43	0.91	2.7145	0.209	8.25
Standard Deviation			1.44	0.93	0.59	1.7619	0.135	5.35
CV			33.96	40.48	131.47	6.56	1.01	6.52
Grand Mean			4.25	2.30	0.45	26.8735	13.455	82.16
Levene's F^			1.239	1.294	0.873	5.398	0.396	5.06
Levene's Prob(F)			0.336	0.317	0.503	0.007*	0.808	0.009*
Rank X2			.	.	.	.	.	.
P(Rank X2)			.	.	.	.	.	.
Skewness^			1.0578*	0.2079	1.2154*	0.1736	-0.3591	0.1845
Kurtosis^			3.0286*	3.3141*	2.375*	-0.9335	-0.2225	-0.9057
Replicate F			1.240	0.231	0.524	14.258	3.227	14.749
Replicate Prob(F)			0.3383	0.8732	0.6741	0.0003	0.0610	0.0002
Treatment F			31.080	18.231	4.429	1.256	0.982	1.223
Treatment Prob(F)			0.0001	0.0001	0.0199	0.3397	0.4535	0.3518

Crop Type, Code
 C = EPPO species (Bayer) codes
 GLXMA, BSOY, Glycine max, Soybean = US
 Part Rated
 PLANT = plant
 C = Crop is Part Rated
 Rating Type
 PHYGEN = phytotoxicity - general / injury
 WEIGHT = weight
 MOICON = moisture content
 YIELD = yield
 Rating Unit/Min/Max
 % , 0, 100 = percent
 LB, , = pound
 BU, , = bushel
 ARM Action Codes
 TY1 = 3.07301587*[4]*(100-[5])/87

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
 Untreated treatment(s) 1 excluded from analysis.
 ^Calculated from residual.